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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/670,754	09/24/2003	Chetan Singh Solanki	IMEC197.001CP1	2815

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EXAMINER	
PERT, EVAN T	

ART UNIT	PAPER NUMBER
2829	

DATE MAILED: 10/20/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/670,754	SOLANKI, CHETAN SINGH	
	Examiner	Art Unit	
	Evan Pert	2829	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *24 September 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-21* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-21* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *23 February 2004* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *0104*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Specification

1. The disclosure is objected to for containing grammatical informalities:

In the abstract, for example, the sentence "The porous layer is removed and the released porous layer from the surface of the substrate." is not a grammatically correct sentence.

In the abstract, and throughout the specification, applicant uses "F-" to mean "fluorine ions." Applicant should revise the "F-" symbol to explicitly recite "fluorine ions," at least in the abstract of the specification, for increased clarity.

At the 5th to last line of the abstract "potion" should read --portion--.

In [0003], 2nd sentence, the plural "layers" does match "*its* lift-off."

In [0006], "of porous layer" should properly read --of a porous layer--.

In [0026], "Formation" should be --A formation--, for proper grammar.

At [0026], top of page 6, "ion in" should read --ions in--.

In the Table after [0042], under the column entitled "Sample surface history," the data bars are skewed.

Appropriate correction is required. Furthermore, applicant is encouraged to identify and correct any informalities overlooked by this objection to the specification.

Drawings

2. The drawings are objected for non-compliance with 37 CFR 1.84(p)(3), which requires lettering to be "at 1/8 inch in height."

Claim Objections

3. Claims 1-3, 5, 8, 12 and 16 are objected to because of the following informalities:

In claim 8, line 5, "potion" should read –portion--.

In claim 12, line 3, "potion" should read --portion--.

In claim 1, the notation "F- F-(t)" should be changed to --fluorine ions, $F^-(t)$--, for increased clarity.

The same comment on "F-" in claim 1 applies to claims 16 and 17.

In claim 5, in line 2, "a" does not match plural "layers".

In claim 16, line 2, "a surface the" should read --a surface of the--.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-15 and 17-18 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

"Release" with "Remove"

In the method recited in claim 1, a "porous layer" is "released" and then the layer is "removed from the surface." How can the layer be "released," yet not "removed from the surface"? If the layer is "released," it is ambiguous how the layer is "removed from the surface" *after* a "release."

Does "release" have a special meaning such as: "attain a higher porosity that is detachable"?, or is "release" supposed to have the plain meaning: "detach" or "separate" from the surface?

For purposes of examination, a "release" of a layer is a "detaching" of a layer and a "removal" of a layer is either a "removal" from "the surface," which is simultaneous with "release" or is a "removal" from an etching tank or container, for example.

Claim Term Antecedent Basis

In claim 8, there is lack of antecedent basis for "said released layer" in line 11.

In claim 12, there is lack of antecedent basis for "said released layer" in line 8.

In claim 12, there is lack of antecedent basis for "said container" in line 4.

In claim 10, there is lack of antecedent basis for "said lift-off " in line 2.

In claim 14, there is lack of antecedent basis for "said lift-off' in line 1.

"constant over time"

In claims 2-3 and 17-18, current and/or fluorine ion concentration is/are "substantially constant over time," but the *time* period during which the time-dependent current and concentration are "constant" is not clear. For purposes of examination, the concentration and current are constant during any "time period" of the entire method, from the start of "etching" until the moment the porous layer is "released" (i.e. detached). In Fig. 3 of Solanki et al. ["Thin Monocrystalline Silicon Films for Solar Cells"], for example, curves 1, 2 and 3 are all "substantially constant over time" for a time period.

Applicant is required to amend the claims to establish what the "time" (i.e. the "time period") is in the claims.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

As interpreted in the rejection under 35 USC 112 above, claims 1-6 and 16-20 are rejected under 35 U.S.C. 102(a) as being clearly anticipated by Solanki et al. ("Thin Monocrystalline Silicon Films for Solar Cells") [see last paragraph of Section 1, Section 2 and Section 3, regarding "free-standing PS films" that correspond to "released porous layers" in applicant's claimed methodology].

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

As interpreted in the rejection under 35 USC 112 above, claims 7 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Solanki et al. as applied to claims 1 and 16 above, and further in view of Nakata (US 3,936,328).

Solanki et al. are silent about the "substrate" in their Fig. 1 being an "ingot."

However, Nakata explains that slices of silicon are cut from "a substrate or an ingot" [col. 1, lines 13-20, emphasis added]. That is, Nakata implicitly teaches that the "substrate" shown in Fig. 1 of Solanki et al. can be an "ingot" for *many* slices of material.

It would have been obvious to one of ordinary skill in the art at the time of the invention to use an "ingot" as the "substrate" in Fig. 1 of Solanki et al., motivated by an ability to obtain a greater number of PS films by "reusability of the substrate" wherein an ingot is a large substrate [see Section 3 of Solanki et al. and MPEP 2144].

Double Patenting

7. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970);and, *In re Thorington,* 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

As interpreted in the rejection under 35 USC 112 above, claims 1 and 4 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claim 7 of U.S. Patent No. US 6,649,485.

Although the conflicting claims are not identical, they are not patentably distinct from each other because the broader pending claims 1 and 4 include the patented method of claim 7 where N=1 necessarily.

It would have been obvious to one of ordinary skill in the art at the time of the claimed invention to practice the removal of one porous layer in accordance with the etching procedure of pending claim 1 (i.e. with N=1 in claim 4), directed and motivated by the patented claim 1, "to manufacture a porous layer."

Allowable Subject Matter

8. Claims 8 and 12 would be allowable if rewritten or amended to overcome the rejections under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action, as well as the objections to informalities.

9. Claims 9-11 and 13-15 would be allowable if rewritten to overcome the rejections under 35 U.S.C. 112, 2nd paragraph, and objections, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

10. The following is a statement of reasons for the indication of allowable subject matter:

Regarding claims 8-15, the prior art does not disclose applicant's "apparatus for slicing a semiconductor substrate," distinguished from prior art by "means for protecting at least a portion of the semiconductor substrate from etching solution," the substrate being "inserted through a first hole" combined with a "means for removing a released layer through a second hole."

Applicant's apparatus advantageously allows for the practice of continuous removal of porous silicon layers from an ingot without kerf loss, which could be applicable to mass production of solar cells, for example.

Conclusion

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Evan Pert whose telephone number is 571-272-1969. The examiner can normally be reached on M-F (7:30AM-3:30 PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Tokar, can be reached on 571-272-1957. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

ETP
October 6, 2004

EVAN PERT
PRIMARY EXAMINER